



## Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

## General Notes.

---

### GEOLOGY AND PALEONTOLOGY.

**The Californian Cave Bear.**—In the *NATURALIST* for 1879, page 791, I described a species of bear, previously unknown, which was represented in my collection by a nearly complete skull. The specimen was found in a cave in Shasta county, California, and was in excellent preservation at the time of its discovery, but it had suffered from the ill usage of curious persons. The rami of the lower jaw had been given away and lost, the zygomata had been chopped off, and the canine teeth broken away. The remaining cranium is, however, a fine specimen, and was originally partially covered by stalagmite. A large part of this has been removed, enough being left to demonstrate its geological position.

The species was named *Arctotherium sinum* Cope. It possesses several points of interest. In the first place it is nearly related to the bear of the Pampean epoch of South America, *Arctotherium bonariense* Gervais, which is found in Argentine in association with the remains of gigantic sloth Toxodonts, Glyptodonts, etc. It differs from its Pampean ally in several important respects. The muzzle resembles that of the latter in its extreme brevity, so that both alike were “pug-nosed,” in great contrast to the existing bears. The relative proportions of the remainder of the skull are markedly different in the two species, being more elongate in the *A. sinum* than in the *A. bonariense*. The penultimate premolar, as in the latter, is two-rooted, but it stands in line with the dental series, and not oblique to it and overlapping the other premolars, as in *A. bonariense*, a character which results from the greater abbreviation of this part of the maxillary region in the latter species. There is also a large median third incisive foramen in the Californian species, which is wanting or very small in the Argentine.

As compared with the species of true bear (genus *Ursus*) the Californian cave bear presents many peculiarities apart from the characters which distinguish the genus *Arctotherium*. While the proportions of the posterior part of the skull are much as in the true *Ursi*, the anterior portion is much shorter and wider. The palate and forehead are half as wide again as in the grizzly (*U. horribilis*), or the European cave bear (*U. spelæus*), and the front is much more convex. It is not only con-

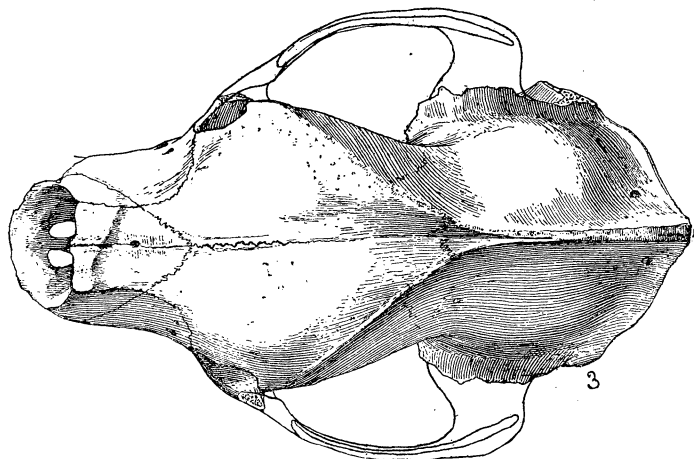
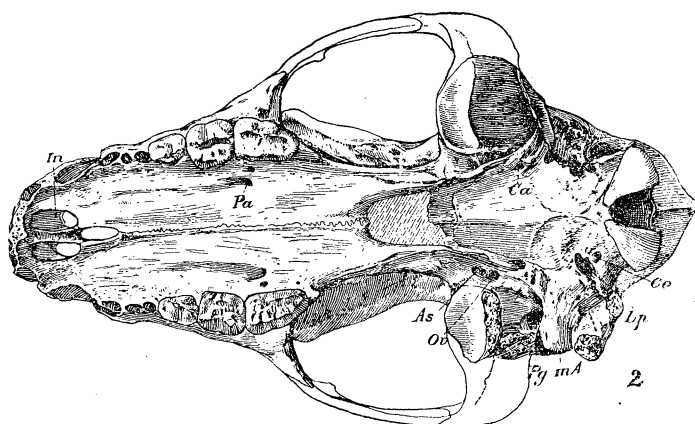
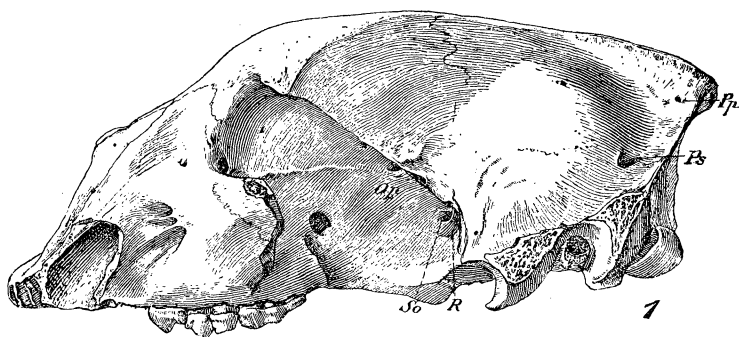
vex anteroposteriorly, as in the *U. spelæus*, but it is regularly convex transversely, which it is not in that species. The two species of *Ursus* named have relatively larger molar teeth than in the other species of the genus, but in the Californian cave bear they are relatively still larger, and especially broader, having a swollen area between the tubercles not recognizable in the m. i. in those species, and but feebly in m. ii. The canines are also relatively larger, judging from the size of their alveoli. Another peculiarity is the presence of three infra-orbital foramina. Ameghino,<sup>1</sup> represents two in the *A. bonariense*.

In dimensions this skull equals that of the largest grizzly bears, and the average of the European cave bears. Some of the latter exceed it in length, but the form in the *A. simum* is more robust than in either of those species. To judge by the skull alone, the Californian cave bear was the most powerful carnivorous mammal which has lived on our continent. Its short nose and full rounded forehead must have given it a peculiar physiognomy. The living mammal which approaches nearest in general appearance is probably the rare black-and-white bear of Thibet, the *Æluropoda melanoleuca* of Milne-Edwards, which connects the Arctotheria with the extinct *Hyænarctos* of the Neocene ages. It was a much larger animal than the *A. melanoleuca*. Unfortunately we can form no idea as to the color of its fur.

Like its South American congener, the Californian *Arctotherium* was associated with gigantic sloths (*Mylodon*), and it belongs to a fauna which has left in other localities in North America *Megatheriums* and *Glyptodonts*. In other words, it is one of the forms which justify the statement which I have made elsewhere (*Proc. Phila. Acad.*, 1867, p. 156; *Proc. Amer. Philos. Soc.*, 1871, p. 99), that during the late Pliocene or early Plistocene an invasion of Mammalia from the south took place. I have suspected that this invasion originated after the north had been covered by an ice sheet which prevented immigration from Asia and permitted it from the south, since no predecessors of the southern types of Mammalia had been found at that time in older North American horizons. Since that was written no ancestral forms of the *Megatheriidae* and *Arctotherium* have been found, but ancestors of several other members of the South American fauna have been discovered. Thus a genus of *Glyptodontidae* (*Caryoderma* Cope) has been found in the Upper Miocene (Loup Fork) of Kansas; and a primitive type of peccaries (*Bothrolabis* Cope) has been obtained from the middle Miocene (John Day) of Oregon. Primitive forms of tapirs occur in the Upper Miocene (Loup Fork; genus *Tapiravus* Marsh).

<sup>1</sup> *Mamm. Foss. Argentinos*, Pl. III., Fig. 1.

PLATE XXI.



*Arctotherium simum* Cope;  $\frac{1}{3}$ .

It has been assumed that South America received its llamas and horses from North America on abundant evidence; and it is now probable that she received the tapirs and peccaries from the same source, since no early types of these lines have been revealed in South American formations by recent extensive researches in that continent. Sloths and Glyptodons are, however, shown by these investigations to have existed in South America during the Eocene period, so that our primitive Glyptodont and Caryoderma may have been an early immigrant from that continent, while the sloths came later. As regards bears, it is well known that we have not found their ancestral types in either of the Americas, but that they are abundantly found in the Neocenes of Europe and India. *Arctotherium* is both the earliest and most primitive form which we possess, and the time of their appearance is the same in both North and South America. They probably reached this continent at a comparatively late date, but earlier than the arrival of the true genus *Ursus*. Between the two genera occurs the *Tremarctos*, of which one species exists still in the Andes, *T. ornatus* Cuv., and one exists in the fossil state, *T. etruscus*, in Europe (Cuvier, Oss. Fossiles, Pl. 189, Fig. 8). This indicates the possible origin of the genus *Ursus* on the American continent, as well as on that of Eurasia; but prior to *Arctotherium* America has nothing, while Eurasia has everything.—E. D. COPE.

#### EXPLANATION OF PLATE.

Skull of *Arctotherium simum* less than one-fifth natural size, linear.

Fig. 1, profile; 2, from below; 3, from above.

Foramina: In., incisive; Pa., palatine; Op., optic; So., spenoörbital; R., rotundum; As., alisphenoid; Ov., ovale; Pg., postglenoid; Ca., carotid; MA., meatus auditorius externus; Lp., lacerum posterius; Co., condylar; Ps., postsquamosal; Op., postparietal.

**The Work of White Ants in Australia.**—In a recent paper on Central Australia, published in the Proceedings of the London Geographical Society, June, 1891, Mr. Charles Chewings quotes Mr. Woodward as authority for the statement that extensive alterations in the surface of the country are due to the industry of the white ants. Mr. Woodward has traveled over a large part of Australia, and he has had the especial advantage of examining the so-called desert sandstone formations, to the disintegration of which we attribute those endless sandhills that have been so often described as a dessert, but which cannot be strictly so called, since this sandy land is covered, often very thickly, with trees and shrubs. He is of the opinion that a

“great deal of work is done, vastly altering the appearance of the country, by what may appear to many people at first sight a perfectly ridiculous agency,—viz., the white ants; but after passing over the plains or through the thickets, where their hills are so numerous that it is difficult to drive through them, the immense amount of their work can be better appreciated. The clay, cemented with resinous matter, with which they build their nests is as hard as brick, and when these fall to pieces they form clay flats almost impervious to water, and so hard that they will bear a great deal of traffic without being cut up. The work of these creatures can be studied in all stages: first in the thickets where they are commencing work; then in the more open country, where they have got the upper hand of the timber; next on the plains, where half the hills will be found deserted; and lastly on the clay flats, where they have almost entirely disappeared and the scrub has begun to grow again. Another remarkable thing about these nests is the amount of iron they contain, for when a tree has been burnt in which they have built a nest there will be found at its base a mass of iron clinker, looking just as if it had come out of a furnace.”

#### More New Mammalia from the Eocene of Patagonia.—

M. F. Ameghino describes in a new extract from the *Revista* for August, 1891, the results of the last exploration in Patagonia of M. C. Ameghino. These consist of no less than 173 species of Mammalia, by far the greater number of which are new to science.

The most interesting novelty described is a new species of a new genus of *Quadrumania*, which has the dental formula of the Old-World monkeys, with especial resemblances to that of man. This is seen especially in the small canine teeth, which are not followed by a diastema. This genus accentuates the proposition which I have advanced, that the line of the Anthropoid apes and man has been derived directly from the Anthropoid lemur *Anaptomorphus* of the Eocene period. The *Homnuculus patagonicus*, as this remarkable form is called by Ameghino, certainly has considerable resemblance to the former genus, but is more like the true monkeys in its quadritubercular lophodont molars.

The Mammalia described are referable to the following orders:

Marsupialia (?) . . . . .	38
Edentata . . . . .	62
Glires . . . . .	23
Bunotheria (Insectivora) . . . . .	1
(Creodonta) . . . . .	8
Taxeopoda (Litopterna) . . . . .	23
(Quadrumania) . . . . .	1
Toxodontia . . . . .	13

Among the important discoveries are the numerous ? Marsupialia. Several of these belong to the genera allied to the Plagiaulacidae already described by M. Ameghino. The author has discovered a fact long since (*AMERICAN NATURALIST*, 1884) pointed out by myself,—viz., that the cutting inferior molar of the Plagiaulacidae is not homologous with the cutting tooth of the mandible in the Marsupialia Diprotodonta, but is one position posterior to it. I regarded it as the P. m. i. (iv.), but Ameghino, following Thomas's nomenclature, regards it as the m. i. *Garzonia* g. n., *Epanorthus*, and *Microbiotherium* are made types of new families with apparent reason. So is *Abderites*, but no sufficient ground appears to be given in its case. Three new genera and seven new species are referred to the existing family Thylacynidae, thus bringing to light the lost relatives of the Tasmanian wolf-opossum. An affinity between these animals and the Creodonta of the same age is insisted on.

In a previous essay Ameghino shows that *Propalæhoplophorus* has distinct vertebræ, and represents therefore a family entirely distinct from the Glyptodontidae. *Cochlops* belongs to the same family. He adds much to our knowledge of *Peltephilus*, which M. Mercerat declares to be identical with *Cochlops*. Family names appear to be rather carelessly used among the Glires; there are too many of them. Among *Litopterna*, *Mesorhinus* Amegh. is made the type of a new family, which has the external nares placed more anteriorly than in the *Macraucheniiidae*; he includes in it the genera *Mesorhinus*, *Oxyodontotherium*, *Cœlosoma*, *Theosodon*, and the new *Pseudocœlosoma*. Several important points in the structure of *Homalodontotherium* are added; among the rest, that it has an ungrooved astragalar trochlea. A new species is described, and a new genus (*Diorotherium*) is added to the family. Eleven new species are added to the *Proterotheriidae*. *Astropotheriidae* are still referred to the *Amblypoda Taligrada*, and a new genus (*Astrapodon*) is added. Many striking novelties are added to the *Toxodontia*.

This contribution increases our interest in this wonderful fauna, and leads to the hope that we shall soon see the illustrations of some of the forms already promised by M. Ameghino.—E. D. COPE.